

# Guidelines For Natural Ventilation in the Workplace

The Massachusetts State Building Code Sixth Edition, 780 CMR (compiled as in full force and effect on 02/28/97) applies to buildings built or subject to major renovation after this date. For other existing buildings the code in force at the time of their construction determines the requirements. In 780 CMR, Section 1208.0 has language dealing with natural ventilation. This is the only code source in Massachusetts having application to buildings designed to operate on natural ventilation alone. This code is enforced on the local level by the community building inspectors (who also apply local ordinances and variances), and by the Department of Public Safety building inspectors on the state level. Previous editions of the building code have similar requirements.

The presence of operable windows in a building allows the structure to meet the requirements of the Massachusetts State Building Code 6th Edition (as well as proceeding editions) under the following circumstances:

- Section 1208.1 **General Ventilation** - requires that natural ventilation of an occupied space shall be through windows, doors, louvers or other natural openings to the outside air.
- Section 1208.2 **Ventilation area required** - requires that the minimum openable area to the outdoors shall be 4 percent of the floor area being ventilated (for example: a 10 ft. by 10 ft. room equals 100 square feet of floor space, multiplied by 0.04 would require an openable area of 4 square feet).
- Section 1208.2.1 **Adjoining spaces** - deals with rooms and spaces in a naturally ventilated building that do not have openings directly to the outside. They can be ventilated through adjoining rooms or spaces provided that the unobstructed opening to the adjoining space is at least 8 percent of the floor area and not less than 25 square feet.

All of this pre-supposes that the windows and doors are used by the occupants for ventilation. In many buildings they are not. In our experience, this is affected by two factors.

- 1) The cost of operating the building within the requirements of thermal comfort, especially while depending on an electrical heating system.
- 2) Differing perceptions of thermal comfort among the staff in the area.

The proposed American Society of Heating, Refrigeration and Air-conditioning Engineers (ASHRAE) ASHRAE Standard 62-1989R, currently under review for adoption by this professional society, states in Section 8.2.2 the following relative to the operation of a natural ventilation system. "Natural ventilation systems shall be operated during periods of occupancy. The amount and location of openings that are operated shall be determined by the occupants to provide sufficient ventilation." Typically, once these standards are accepted they are incorporated into the next revision of the building code.



## Workplace Safety and Health Program Guidelines

- If windows are to be used as a source of outside air in the ventilation of a building, it should be assured that:

- A) they are safe and secure,
- B) they are easy to operate,
- C) they are screened, and,

provisions are made to maintain comfort and eliminate drafts in cooler weather (i.e. opening tops of windows or installing draft deflectors (slanted panels of safety glass or plastic at the base of the window that forces incoming air to disperse higher and over a wider pattern)).



- Cross ventilation is the principle way to make natural ventilation through open windows effective. Occupants of areas with opposing windows should be encouraged to take advantage of this. Other spaces, where doors are opposed to the window bearing walls, can achieve a similar effect by leaving the door and window open.
- The staff should also be encouraged to dress for the indoor climate as well as the climate outdoors. Have sweaters and suit jackets or other types of clothing available, which will allow for a maximum of individual freedom while maximizing the ventilation in the building.
- Window mounted air conditioners often impact the use of windows in warm weather. If so equipped, they should be operated in the “vent open” mode during warm weather. It should be noted that these units are not designed as primary ventilators and are therefore only marginally effective as a source of fresh air. If units do not exhaust air and/or supply fresh outside air, they may not ventilate effectively. These units should not be used at all if they cannot be adequately maintained, cleaned and have regular filter changes.
- Attention should also be paid to the window sills. They should be kept clean; free from flaking (possibly Lead) paint, and, bird droppings which may carry serious health problems due to microbiological contamination.